

## CLAIMS

What is claimed is:

1. A method of correcting a printing error in an inkjet printer having a printer head on which a 1<sup>st</sup> through 2N<sup>th</sup> nozzles are provided, in which N is a positive integer greater than 0, and a feed roller, the method comprising:

determining if a trailing end of a print paper has escaped from the feed roller which periodically moves the print paper a width of the printer head;

if the trailing end of the print paper is determined to have escaped from the feed roller, moving the print paper half the width of the printer head width, and printing a reference line at a predetermined interval using a k<sup>th</sup> nozzle ( $1 \leq k \leq N$ ) from among the 1<sup>st</sup> through N<sup>th</sup> nozzles;

moving the print paper on which the reference line is printed half the width of the printer head, and printing comparison lines at a predetermined interval using the (N+1)<sup>th</sup> through 2N<sup>th</sup> nozzles;

detecting an error distance between the reference line and one of the comparison lines printed by the l<sup>th</sup> nozzle ( $N+1 \leq l \leq 2N$ ), the l<sup>th</sup> nozzle being disposed at a position corresponding to the k<sup>th</sup> nozzle among the (N+1)<sup>th</sup> through 2N<sup>th</sup> nozzles; and

correcting a distance that the print paper is moved according to the detected error distance.

2. The method as claimed in claim 1, wherein the 1<sup>st</sup> through N<sup>th</sup> nozzles are disposed above the print paper.

3. The method as claimed in claim 1, wherein the reference line is printed by ejecting ink onto the print paper.

4. The method as claimed in claim 1, wherein the correcting the distance that the print paper is moved comprises moving the print paper by a distance less than the width of the printer head.

5. The method as claimed in claim 4, wherein the distance less than the width of the printer head is the error distance.

6. The method as claimed in claim 1, wherein the detecting an error distance comprises:

- determining if one of the comparison lines is a comparison line matching the reference line; and
- if determined that one of the comparison lines is a comparison line matching the reference line, calculating a nozzle distance between the  $l^{\text{th}}$  nozzle and the  $m^{\text{th}}$  nozzle ( $N+1 \leq m \leq 2N$ ), the  $m^{\text{th}}$  nozzle having printed the comparison line matching the reference line, and detecting the calculated nozzle distance as the error distance.

7. A method of correcting a printing error in an inkjet printer having a printer head on which a  $1^{\text{st}}$  through  $2N^{\text{th}}$  nozzles are provided, in which  $N$  is a positive integer greater than 0, and a feed roller, the method comprising:

- determining if a trailing end of a print paper has escaped from the feed roller which periodically moves the print paper a width of the printer head;

- if the trailing end of the print paper is determined to have escaped from the feed roller, moving the print paper half the width of the printer head, and printing a reference line at a predetermined interval using a  $k^{\text{th}}$  nozzle ( $1 \leq k \leq N$ ) from among the  $1^{\text{st}}$  through  $N^{\text{th}}$  nozzles;

- moving the print paper on which the reference line is printed as much as half the width of the printer head  $\pm$  a nozzle distance between neighboring nozzles divided by  $p$ , in which  $p$  is a positive integer greater than 0, and printing comparison lines at a predetermined interval using the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles;

- detecting an error distance between the reference line and one of the comparison lines printed by the  $l^{\text{th}}$  nozzle ( $N+1 \leq l \leq 2N$ ), the  $l^{\text{th}}$  nozzle being disposed at a position corresponding to the  $k^{\text{th}}$  nozzle among the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles; and

- correcting a distance that the print paper is moved according to the detected error distance.

8. The method as claimed in claim 7, wherein the  $1^{\text{st}}$  through  $N^{\text{th}}$  nozzles are disposed above the print paper.

9. The method as claimed in claim 7, wherein the reference line is printed by ejecting ink onto the print paper.

10. The method as claimed in claim 7, wherein the correcting the distance that the print paper is moved comprises moving the print paper by a distance less than the width of the printer head.

11. The method as claimed in claim 10, wherein the distance less than the width of the printer head is the error distance.

12. The method as claimed in claim 7, wherein the detecting an error distance comprises:

determining if one of the comparison lines is a comparison line matching the reference line;

if determined that the one of the comparison lines is a comparison line matching the reference line, calculating a nozzle distance between the  $l^{\text{th}}$  nozzle and the  $m^{\text{th}}$  nozzle ( $N+1 \leq m \leq 2N$ ), the  $m^{\text{th}}$  nozzle having printed the comparison line matching the reference line; and

adding or deducting the nozzle distance between neighboring nozzles/p to or from the calculated nozzle distance, and detecting the added or deducted nozzle distance as the error distance.

13. An apparatus for correcting a printing error in an inkjet printer having a printer head on which a  $1^{\text{st}}$  through  $2N^{\text{th}}$  nozzles are provided, in which  $N$  is a positive integer greater than 0, and a feed roller, the apparatus comprising:

a print paper escape detector which detects whether a trailing end of a print paper has escaped from the feed roller which periodically moves the print paper a width of the printer head, and outputs the result of the detection as a first control signal;

a feed roller driving controller which outputs a second control signal to move the print paper half the width of the printer head in response to the first control signal, a fourth control signal to move the print paper half the width of the printer head in response to a third control signal, and a seventh control signal to move the print paper by a corrected distance in response to a sixth control signal;

a printer head ejection controller which outputs the third control signal to print a reference line using a  $k^{\text{th}}$  nozzle ( $1 \leq k \leq N$ ) from among the  $1^{\text{st}}$  through  $N^{\text{th}}$  nozzles in response to the second control signal, and a fifth control signal to print comparison lines using the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles in response to the fourth control signal; and

an error distance detector which detects an error distance between the reference line and a one of the comparison lines printed by the  $l^{\text{th}}$  nozzle ( $N+1 \leq l \leq 2N$ ), the  $l^{\text{th}}$  nozzle being disposed at a position corresponding to the  $k^{\text{th}}$  nozzle from among the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles, in response to the fifth control signal, and outputs the result of the detection as the sixth control signal.

14. The method as claimed in claim 13, wherein the  $1^{\text{st}}$  through  $N^{\text{th}}$  nozzles are disposed above the print paper.

15. The method as claimed in claim 13, wherein the reference line is printed by ejecting ink onto the print paper.

16. The method as claimed in claim 13, wherein the correcting the distance that the print paper is moved comprises moving the print paper by a distance less than the width of the printer head.

17. The method as claimed in claim 16, wherein the distance less than the width of the printer head is the error distance.

18. The apparatus as claimed in claim 13, wherein the error distance detector comprises:

a reference line match detector which detects if one of the comparison lines is a comparison line matching the reference line, and outputs the result of the detection as an eighth control signal; and

a nozzle distance calculator which calculates a nozzle distance between the  $l^{\text{th}}$  nozzle and the  $m^{\text{th}}$  nozzle ( $N+1 \leq m \leq 2N$ ), the  $m^{\text{th}}$  nozzle having printed the comparison line matching the reference line, in response to the eighth control signal, and outputs the calculated nozzle distance as a ninth control signal indicating the error distance.

19. An apparatus for correcting a printing error in an inkjet printer having a printer head on which a 1<sup>st</sup> through 2N<sup>th</sup> nozzles are provided, in which N is a positive integer greater than 0, and a feed roller, the apparatus comprising:

a print paper escape detector which detects whether a trailing end of a print paper has escaped from the feed roller which periodically moves the print paper a width of the printer head, and outputs the result of the detection as a tenth control signal;

a feed roller driving controller which outputs an eleventh control signal to move the print paper half the width of the printer head in response to the tenth control signal, a thirteenth control signal to move the print paper half the width of the printer head  $\pm$  a nozzle distance between neighboring nozzles divided by p, in which p is a positive integer greater than 0, in response to a twelfth control signal, and a sixteenth control signal to move the print paper by a corrected distance in response to a fifteenth control signal;

a printer head ejection controller which outputs the twelfth control signal to print a reference line using a k<sup>th</sup> nozzle ( $1 \leq k \leq N$ ) from among the 1<sup>st</sup> through N<sup>th</sup> nozzles in response to the eleventh control signal, and a fourteenth control signal to print comparison lines using the (N+1)<sup>th</sup> through 2N<sup>th</sup> nozzles in response to the thirteenth control signal; and

an error distance detector which detects an error distance between the reference line and one of the comparison lines printed by the l<sup>th</sup> nozzle ( $N+1 \leq l \leq 2N$ ), the l<sup>th</sup> nozzle being disposed at a position corresponding to the k<sup>th</sup> nozzle among the (N+1)<sup>th</sup> through 2N<sup>th</sup> nozzles, in response to the fourteenth control signal, and outputs the result of the detection as the fifteenth control signal.

20. The apparatus as claimed in claim 19, wherein the error distance detector comprises:

a reference line match detector which detects if a one of the comparison lines is a comparison line matching the reference line, and outputs the result of the detection as a seventeenth control signal;

a nozzle distance calculator which calculates a nozzle distance between the l<sup>th</sup> nozzle and the m<sup>th</sup> nozzle ( $N+1 \leq m \leq 2N$ ), the m<sup>th</sup> nozzle having printed the one of the comparison lines matching the reference line in response to the seventeenth control signal, and outputs the calculated nozzle distance as an eighteenth control signal; and

a distance calculation corrector which adds or deducts the nozzle distance between the neighboring nozzles divided by  $p$  to or from the calculated nozzle distance, and outputs the added or deducted nozzle distance as a nineteenth control signal indicating the error distance.

21. A method of correcting a printing error in an inkjet printer having a printer head on which a 1<sup>st</sup> through  $(S \times N)^{\text{th}}$  nozzles are provided, in which  $N$  and  $S$  are positive integers greater than 1, and a feed roller, the method comprising:

determining whether a trailing end of a print paper has escaped from the feed roller which periodically moves the print paper a width of the printer head;

if the trailing end of the print paper is determined to have escaped from the feed roller, moving the print paper the width of the printer head divided by  $S$ , and printing a reference line at a predetermined interval using a  $k^{\text{th}}$  nozzle ( $1 \leq k \leq N$ ) from among the 1<sup>st</sup> through  $N^{\text{th}}$  nozzles;

moving the print paper on which the reference line is printed the width of the printer head divided by  $S$ , and printing comparison lines at a predetermined interval using the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles;

detecting an error distance between the reference line and a one of the comparison line printed by the  $l^{\text{th}}$  nozzle ( $N+1 \leq l \leq 2N$ ), the  $l^{\text{th}}$  nozzle being disposed at a position corresponding to the  $k^{\text{th}}$  nozzle among the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles; and

correcting a distance that the print paper is moved according to the detected error distance.

22. The method as claimed in claim 21, wherein the 1<sup>st</sup> through  $N^{\text{th}}$  nozzles are disposed above the print paper.

23. The method as claimed in claim 21, wherein the reference line is printed by ejecting ink onto the print paper.

24. The method as claimed in claim 21, wherein the correcting the distance that the print paper is moved comprises moving the print paper by a distance less than the width of the printer head.

25. The method as claimed in claim 24, wherein the distance less than the width of the printer head is the error distance.

26. A method of correcting a printing error in an inkjet printer having a printer head on which a 1<sup>st</sup> through  $(S \times N)^{\text{th}}$  nozzles are provided, in which N and S are positive integers greater than 1, and a feed roller, the method comprising:

determining whether a trailing end of a print paper has escaped from the feed roller which periodically moves the print paper a width of the printer head;

if the trailing end of the print paper is determined to have escaped from the feed roller, moving the print paper the width of the printer head divided by S, and printing a reference line at a predetermined interval using a  $k^{\text{th}}$  nozzle ( $1 \leq k \leq N$ ) from among the 1<sup>st</sup> through  $N^{\text{th}}$  nozzles;

moving the print paper on which the reference line is printed as the width of the printer head divided by  $S \pm$  the nozzle distance between neighboring nozzles divided by p, in which p is a positive integer greater than 0, and printing comparison lines at a predetermined interval using the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles;

detecting an error distance between the reference line and one of the comparison lines printed by the  $l^{\text{th}}$  nozzle ( $N+1 \leq l \leq 2N$ ), the  $l^{\text{th}}$  nozzle being disposed at a position corresponding to the  $k^{\text{th}}$  nozzle among the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles; and

correcting a distance that the print paper is moved according to the detected error distance.

27. The method as claimed in claim 26, wherein the 1<sup>st</sup> through  $N^{\text{th}}$  nozzles are disposed above the print paper.

28. The method as claimed in claim 26, wherein the reference line is printed by ejecting ink onto the print paper.

29. The method as claimed in claim 26, wherein the correcting the distance that the print paper is moved comprises moving the print paper by a distance less than the width of the printer head.

30. The method as claimed in claim 29, wherein the distance less than the width of the printer head is the error distance.

31. An apparatus for correcting a printing error in an inkjet printer having a printer head on which a 1<sup>st</sup> through  $(S \times N)^{\text{th}}$  nozzles are provided, in which N and S are positive integers greater than 1, and a feed roller, the apparatus comprising:

a print paper escape detector which detects whether a trailing end of a print paper has escaped from the feed roller which periodically moves the print paper a width of the printer head and outputs the result of the detection as a twentieth control signal;

a feed roller driving controller which outputs a twenty-first control signal to move the print paper the width of the printer head divided by S in response to the twentieth control signal, a twenty-third control signal to move the print paper the width of the printer head divided by S in response to a twenty-second control signal, and a twenty-sixth control signal to move the print paper a corrected distance in response to a twenty-fifth control signal;

a printer head ejection controller which outputs the twenty-second control signal to print a reference line using a  $k^{\text{th}}$  nozzle ( $1 \leq k \leq N$ ) from among the 1<sup>st</sup> through  $N^{\text{th}}$  nozzles in response to the twenty-first control signal, and a twenty-fourth control signal to print comparison lines using the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles in response to the twenty-third control signal; and

an error distance detector which detects an error distance between the reference line and one of the comparison lines printed by the  $l^{\text{th}}$  nozzle ( $N+1 \leq l \leq 2N$ ), the  $l^{\text{th}}$  nozzle being disposed at a position corresponding to the  $k^{\text{th}}$  nozzle among the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles, in response to the twenty-fourth control signal, and outputs the result of the detection as the twenty-fifth control signal.

32. An apparatus for correcting a printing error in an inkjet printer having a printer head on which a 1<sup>st</sup> through  $(S \times N)^{\text{th}}$  nozzles are provided, in which N and S are positive integers greater than 1, and a feed roller, the apparatus comprising:

a print paper escape detector which detects if a trailing end of a print paper has escaped from the feed roller which periodically moves the print paper a width of the printer head, and outputs the result of the detection as a twenty-seventh control signal;



a feed roller driving controller which outputs a twenty-eighth control signal to move the print paper as the width of the printer head divided by  $S$  in response to the twenty-seventh control signal, a thirtieth control signal to move the print paper the width of the printer head divided by  $S \pm$  the nozzle distance between neighboring nozzles divided by  $p$ , in which  $p$  is a positive integer greater than 0, in response to a twenty-ninth control signal, and a thirty-third control signal to move the print paper a corrected distance in response to a thirty-second control signal;

a printer head ejection controller which outputs the twenty-ninth control signal to print a reference line using a  $k^{\text{th}}$  nozzle ( $1 \leq k \leq N$ ) from among the  $1^{\text{st}}$  through  $N^{\text{th}}$  nozzles in response to the twenty-eighth control signal, and a thirty-first control signal to print comparison lines using the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles in response to the thirtieth control signal; and

an error distance detector which detects an error distance between the reference line and one of the comparison lines printed by the  $l^{\text{th}}$  nozzle ( $N+1 \leq l \leq 2N$ ), the  $l^{\text{th}}$  nozzle being disposed at a position corresponding to the  $k^{\text{th}}$  nozzle among the  $(N+1)^{\text{th}}$  through  $2N^{\text{th}}$  nozzles, in response to the thirty-first control signal, and outputs the result of the detection as the thirty-second control signal.

33. A method of correcting a printing error in an inkjet printer having a printer head, on which nozzles are provided, and a feed roller, the method comprising:

determining if a trailing end of a print paper has escaped from the feed roller which periodically moves the print paper;

if the trailing end of the print paper is determined to have escaped from the feed roller, moving the print paper a first distance, and printing a reference line at a predetermined interval;

moving the print paper on which the reference line is printed a second distance, and printing comparison lines at a predetermined interval;

detecting an error distance between the reference line and one of the comparison lines; and

correcting a distance that the print paper is moved according to the detected error distance.

34. The method as claimed in claim 33, wherein the first distance is a percentage of the width of the printer head.

35. The method as claimed in claim 34, wherein the first distance is half the width of the printer head.

36. The method as claimed in claim 33, wherein the second distance is equal to the first distance.

37. The method as claimed in claim 33, wherein the second distance is equal to the first distance  $\pm$  the distance between neighboring nozzles divided by an integer  $p$ .

38. The method as claimed in claim 33, wherein an exhaust roller moves the print paper, on which the reference line is printed, the second distance.

39. An apparatus for correcting a printing error in an inkjet printer having a printer head, on which nozzles are provided, and a feed roller, the apparatus comprising:

a print paper escape detector which detects whether a trailing end of a print paper has escaped from the feed roller which periodically moves the print paper, and outputs the result of the detection as a first control signal;

a feed roller driving controller which outputs a second control signal to move the print paper in response to the first control signal, a fourth control signal to move the print paper in response to a third control signal, and a seventh control signal to move the print paper by a corrected distance in response to a sixth control signal;

a printer head ejection controller which outputs the third control signal to print a reference line in response to the second control signal, and a fifth control signal to print comparison lines in response to the fourth control signal; and

an error distance detector which detects an error distance between the reference line and one of the comparison lines in response to the fifth control signal, and outputs the result of the detection as the sixth control signal.

40. The apparatus of claim 39, further comprising an exhaust roller to move the print paper if a trailing end of a print paper has escaped from the feed roller.

41. The apparatus of claim 39, wherein the error distance detector comprises:

a reference line match detector which detects if a one of the comparison lines is a comparison line matching the reference line, and outputs the result of the detection as an eighth control signal; and

a nozzle distance calculator which calculates a nozzle distance between the nozzle that printed the reference line and the nozzle that printed the comparison line matching the reference line, in response to the eighth control signal, and outputs the calculated nozzle distance as an ninth control signal.

42. The apparatus of claim 39, wherein the ninth control signal indicates the error distance.

43. The apparatus of claim 39, further comprising a distance calculation corrector which adds or deducts the nozzle distance between neighboring nozzles divided by a positive integer  $p$  to or from the calculated nozzle distance, and outputs the added or deducted nozzle distance as a tenth control signal indicating the error distance.